

1 **Amendment to the Claims**

2 **In the Claims:**

3 Please cancel Claim 36.

4 Please amend Claims 34 and 37-53 as follows:

5 Claims 1-33 (Previously Canceled)

6 34. (Currently Amended) A method for detecting a ~~feature associated with an object~~ feature
7 using an imaging system, where the feature is part of an object and a probe can be attached to the
8 feature, comprising the steps of:

9 (a) providing at least one labeled probe that selectively binds to said feature,
10 wherein said at least one labeled probe comprises a binding element that selectively binds to at least a
11 portion of said feature, and at least one optical signaling component;

12 (b) exposing said object to said at least one labeled probe under conditions that
13 cause said at least one labeled probe to bind to at least a portion of said feature, if said feature is
14 ~~associated with~~ part of said object, such that a plurality of different optical signaling components
15 become bound to said feature;

16 (c) collecting light from said object along a collection path, the light that is collected
17 comprising light corresponding to each of the plurality of different optical signaling components that has
18 been simultaneously collected;

19 (d) focusing the collected light to produce an image corresponding to the object,
20 locations of labeled probes bound to said feature included in the image being optically discriminated but not
21 spatially discriminated in the image;

22 (e) detecting the image to produce a signal indicative of each optical signaling
23 component bound to said feature; and

24 (f) analyzing the signal to determine if a spectral component due to each optical
25 signaling component bound to said feature is present in the image, thereby establishing that said feature
26 is ~~associated with~~ part of the object.

27 35. (Previously Presented) The method of Claim 34, wherein the step of exposing said object
28 to said at least one labeled probe comprises the step of exposing said object to a labeled probe that
29 comprises said plurality of different optical signaling components, thereby binding said plurality of
30 optical signaling components to said feature.

1 36. (Currently Canceled)

2 37. (Currently Amended) The method of ~~Claim 36~~ Claim 34, wherein the step of analyzing
3 the signal comprises the step of determining if an intensity of a waveband of light indicative of said
4 plurality of different optical signaling components is present in the image.

5 38. (Currently Amended) The method of ~~Claim 35~~ Claim 34, wherein ~~the step of exposing~~
6 ~~said object to at least one labeled probe comprises the step of exposing said object to a labeled probe~~
7 ~~that comprises a plurality of different optical signaling components~~ said object comprises a biological
8 cell, and said feature comprises a cellular component.

9 39. (Currently Amended) The method of ~~Claim 38~~ Claim 34, wherein the step of analyzing
10 the signal comprises the step of determining if a multiplex of a spectral signature for each of the
11 plurality of different optical signaling components is present in the image.

12 40. (Currently Amended) The method of ~~Claim 35~~ Claim 34, wherein the step of exposing
13 said object to at least one labeled probe ~~that comprises the plurality of optical signaling components~~
14 comprises the step of exposing said object to at least two labeled probes, each of which comprises a
15 binding element that selectively binds to at least a portion of the feature, each of which comprises at
16 least one optical signaling component, one of which includes a different optical signaling component,
17 thereby binding the plurality of different optical signaling components to said feature.

18 41. (Currently Amended) The method of Claim 34, further comprising the step of dispersing
19 the light that is traveling along the collection path into a plurality of light beams, as a function of a
20 plurality of different discriminable characteristics of the light, wherein:

21 (a) the step of focusing the collected light to produce an image corresponding to the
22 object comprises the step of focusing each of the plurality of light beams to produce a respective image
23 corresponding to that light beam, thereby generating a plurality of images;

24 (b) the step of detecting the image comprises the step of responding to each of the
25 plurality of images, producing a different signal for each of the plurality of images; and

26 (c) the step of analyzing the signal comprises the step of analyzing each different signal
27 produced for each of the plurality of images to determine if indicative spectral signals produced by the
28 plurality of different optical signaling components are present, thereby establishing that the feature is
29 ~~associated with~~ part of the object.

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1 42. (Currently Amended) A method for probing an object with labeled probes to detect if
2 any of a plurality of specific features ~~is associated with~~ are part of the object, using an imaging
3 system that does not spatially resolve locations of the labeled probes on any specific feature, wherein
4 such labeled probes can be attached to each such feature, the method comprising the steps of:

5 (a) for each specific feature to be detected, providing at least one labeled probe
6 that selectively couples to a corresponding specific feature, wherein each labeled probe comprises a
7 binding element that selectively binds to at least a portion of the specific feature, and at least one
8 optical signaling component that is bound to the specific feature by the binding element;

9 (b) exposing said object to said at least one labeled probe for each specific feature
10 to be detected, under conditions that cause each labeled probe to couple to at least a portion of its
11 corresponding specific feature, if that corresponding specific feature is ~~associated with~~ part of said
12 object, such that at least two different optical signaling components become bound to each specific
13 feature ~~associated with~~ that is part of said object, each of said at least two different optical signaling
14 components that is bound to each specific feature being uniquely optically discriminable ~~based upon~~
15 ~~a multiplex of the light from the optical signaling components, without spatially resolving a location~~
16 ~~of each labeled probe coupled to a specific feature~~;

17 (c) simultaneously detecting light from all optical signaling components
18 ~~associated with~~ bound to any specific feature that is part of said object, producing a corresponding
19 signal; and

20 (d) analyzing the signal to detect each optical signaling component bound to any
21 specific feature ~~associated with~~ that is part of the object, thereby determining which specific feature is
22 ~~associated with~~ part of the object.

23 43. (Currently Amended) The method of Claim 42, wherein the step of exposing said object
24 to said at least one labeled probe comprises the step of exposing said object to a labeled probe having
25 a plurality of different optical signaling components, thereby binding the plurality of optical signaling
26 components to said corresponding specific feature ~~associated with~~ that is part of the object.

27 44. (Currently Amended) The method of ~~Claim 43~~ Claim 42, wherein ~~the step of exposing~~
28 ~~said object to a labeled probe comprises the step of exposing said object to a labeled probe that~~
29 ~~comprises a plurality of identical optical signaling components~~ said object comprises a biological
30 cell, and each feature comprises a cellular component.

1 45. (Currently Amended) The method of Claim 43, wherein the step of exposing said object
2 to a labeled probe comprises the step of exposing said object to a labeled probe that comprises at least
3 two different optical signaling components, thereby binding the plurality of optical signaling
4 components to said corresponding specific feature that is part of the object.

5 46. (Currently Amended) The method of Claim 43, wherein the step of exposing said object
6 to a labeled probe comprises the step of exposing said object to at least two labeled probes selected to
7 selectively bind to different portions of a first specific feature, each of said at least two labeled probes
8 comprising:

9 (a) a binding element that selectively binds to at least a portion of the first specific
10 feature; and

11 (b) at least one optical signaling component that is bound by the binding element
12 to said at least a portion of the first specific feature, such that one of the at least two labeled probes
13 comprises a different optical signaling component, so that a plurality of different optical signaling
14 components are bound to the first specific feature.

15 47. (Currently Amended) The method of Claim 42, wherein the step of simultaneously
16 detecting light from all optical signaling components ~~associated with~~ bound to any feature that is part
17 of said object comprising comprises the steps of:

18 (a) collecting light from said object along a collection path, said light comprising a
19 multiplexed optical signal from ~~the~~ any optical signaling components coupled to each feature;

20 (b) focusing the collected light to produce an image corresponding to the object; and

21 (c) detecting the image, said collected light forming the image including optical
22 components indicative of the optical ~~signal~~ signaling components that are bound to each specific feature
23 ~~associated with~~ that is part of the object.

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1 48. (Currently Amended) The method of Claim 42, wherein the step of simultaneously
2 detecting light from all optical signaling components bound to each feature ~~associated with~~ that is
3 part of said object comprises the steps of:

- 4 (a) collecting light from said object along a collection path; ~~and~~
5 (b) dispersing the light that is traveling along the collection path into a plurality of
6 light beams, as a function of a plurality of different discriminable characteristics of the light;
7 (c) focusing each of the plurality of light beams to produce a respective image
8 corresponding to that light beam, thereby generating a plurality of images; and
9 (d) detecting the plurality of images.

10 49. (Currently Amended) The method of Claim 42, wherein each optical signaling
11 component comprises a fluorescent dye, further comprising the step of directing sufficient energy
12 toward said object, such that the fluorescent dye is excited to emit a fluorescent light comprising a
13 uniquely discriminable characteristic of the optical ~~signal-signaling~~ component.

14 50. (Currently Amended) The method of Claim 42, wherein an optical signature of said
15 plurality of optical signaling components bound to each specific feature is uniquely discriminable
16 based on an intensity of multiplexed light from the plurality of optical ~~signal-signaling~~ components.

17 51. (Currently Amended) The method of Claim 42, wherein a spectral signature of the
18 plurality of optical signaling components bound to a specific feature is uniquely discriminable based
19 on ~~its spectral composition~~ a spectral composition of light from the plurality optical ~~signal~~ signaling
20 components.

21 52. (Currently Amended) A method for determining whether or not a specific ~~physical~~
22 feature is part of an object using an imaging system, where a labeled probe can be attached to the
23 feature, comprising the steps of:

- 24 (a) providing a set of labeled probes defining a spectral signature ~~to~~ that uniquely
25 identifies the specific ~~physical~~ feature, such that the spectral signature uniquely identifying at least
26 one specific ~~physical~~ feature comprises at least two spectrally distinguishable optical signaling
27 components;
28 (b) exposing the object to the set of labeled probes under conditions that cause ~~the~~
29 labeled probes from the set to bind to the specific ~~physical~~ feature, if the specific ~~physical~~ feature is
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1 part of the object, such that the at least two spectrally distinguishable optical signaling components
2 become bound to the specific ~~physical~~ feature;

3 (c) simultaneously detecting light from all optical signaling components
4 ~~associated with~~ that are part of the object, producing a corresponding signal; and

5 (d) analyzing the signal to determine if the spectral signature uniquely identifying the
6 specific ~~physical~~ feature is present, thereby determining whether ~~or not~~ the specific ~~physical~~ feature is part
7 of the object.

8 53. (Currently Amended) A method for probing an object with labeled probes to detect if
9 any of a plurality of specific ~~physical~~ features ~~are associated with the object, where the specific~~
10 features are part of the object and the labeled probes can be attached to the specific features, using an
11 imaging system that simultaneously collects spectral data from each labeled probe ~~associated with~~
12 attached to the specific features that are part of the object ~~simultaneously~~, the method comprising the
13 steps of:

14 (a) for each specific ~~physical~~ feature to be detected, providing a set of labeled
15 probes defining a spectral signature ~~to~~ that uniquely identifies the specific ~~physical~~ feature, such that
16 the spectral signature uniquely identifying at least one specific ~~physical~~ feature comprises at least two
17 spectrally distinguishable components;

18 (b) exposing the object to each set of labeled probes for each specific ~~physical~~
19 feature to be detected, under conditions that cause at least one labeled probe from a corresponding set
20 of labeled probes to couple to its corresponding specific ~~physical~~ feature, if that corresponding
21 specific ~~physical~~ feature is ~~associated with~~ part of the object;

22 (c) simultaneously detecting light from all labeled probes bound to a specific
23 ~~physical~~ feature ~~associated with~~ that is part of the object, producing a corresponding signal; and

24 (d) analyzing the signal to identify each spectral signature included in the light detected,
25 to determine which specific ~~physical~~ features are ~~associated with~~ part of the object.
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